NOAA Teacher at Sea
Jacquelyn Hams
Onboard NOAA Ship RAINIER
July 22-August 11 2006

August 3, 2006

Science and Technology Log

1800

Weather: Partly cloudy
Visibility: 10 nm
Wind direction: 305
Wind speed: 8 knots
Sea Wave height: 0-1 ft.
Swell Waves direction: /
Swell height: /
Seawater temperature: 11.1 degrees C
Sea level pressure: 1002.2 mb
Temperature dry bulb: 14.4 degrees C
Temperature wet bulb: 11.1 degrees C

TAS Jacquelyn Hams viewing sonar images on a survey boat

The day begins with a Damage Control Meeting at 0830. This is an all hands meeting for everyone aboard the ship. Safety is stressed aboard the RAINIER at all times. All hands are shown equipment, patches, and fixes for damages resulting from water, electrical problems, and fire. We are also told where the equipment is stored.

A CTD (Conductivity, Temperature, and Depth) sensor

After lunch I go out on one of the survey boats equipped with multibeam sonar for a hydrography survey. NOAA personnel on the boat are: ENS Jamie Wasser, Junior Officer, ENS Megan McGovern, Junior Officer, Carl Verplank, Seaman Surveyor, and Leslie Abramson, Able Seaman. The goal of this leg of the cruise is to accurately

chart the waters off Nagai Island, Alaska. The boat I am on will survey the area of Northeast Bight.

In order to measure depth, the equation D=S*T is used. The time it takes for the sound to bounce off the bottom and return is known. In order to calculate the distance, the speed at which sound travels through the water must be known. To determine the speed at which sound travels through the water column, the RAINIER collects conductivity, temperature, and pressure data using a CTD sensor called a SEACAT. From these measurements depth and salinity can be derived.

This instrument is deployed into the water at least every four hours during multibeam acquisition. As sound travels through the water, it can be affected by differences in salinity, temperature, and pressure. Therefore, all soundings acquired by the CTD need to be corrected for these effects to accurately chart the survey area.

The SEACAT is placed just below the water's surface for two minutes to allow the sensor to obtain its initial readings. It is then lowered one meter per second through the water column until it reaches the seafloor. Then it is hoisted back to the surface. As the instrument runs through the water column, the sensor obtains conductivity, temperature, and pressure data.

Once the SEACAT is aboard, it is connected to a computer. The sensor data is downloaded using a special program. A survey technician or junior officer uses the program to analyze the data. If the data looks reasonable, the launch or ship will begin or continue to acquire soundings.

View of radar screen at coxswain's station on survey boat.

It is very important for the coxswain (person who is driving the boat) to steer the boat along the survey lines so that the final data will be accurate.

Leslie Abramson assists me while I attempt to steer the boat along the survey line. I find that it is easier to steer the RAINIER than a survey boat!

Leslie Abramson, Able Seaman and coxswain, steers the survey boat

Repeat display of Hy Pack navigation and chart at coxswain's station

Personal Log

I have been on the RAINIER for two weeks now, and have been observing how long the days are for the officers on board. After talking with ENS Olivia Hauser, RAINIER Junior Officer, certain things are now clear. There are no scientists aboard the RAINIER. On other NOAA ships, scientists are hosted by the ship and plan and conduct the research operations. On the RAINIER, the officers are the hydrographers or scientists. In addition to the regular duties, the officers have to plan survey lines, review them at the end of the day, and make plans for the next day. In addition, they go out on the survey boats to view data acquisition. This makes for an incredibly long day and lots of responsibilities for the officers. I am impressed with their energy and dedication to the job.

I had the opportunity to take the classic geology photographs shown below from the survey boat.

A classic U-shaped glacial valley

Is this a cirque or a caldera?